

## ABSTRACT

An accurate thermodynamic model of an Active Lean NO<sub>x</sub> (ALNC) Catalyst is presented. The model takes into account  
5 hydrocarbon storage and release mechanisms of the ALNC, as well as the degradation in the ALNC hydrocarbon conversion efficiency due to ageing, and thus provides a more accurate estimate of an exotherm generated by hydrocarbon combustion in the ALNC. The estimated exotherm can then be used to  
10 detect system degradation and identify components responsible for the degradation.